



Defining berry ripeness

Viti-note Summary:

- Juice or pulp maturity
- Skin maturity
- Phenolic maturity
- Aromatic maturity
- Seed maturity

Generally, bunches of grapes do not ripen to maturity if they are removed from the vine before veraison, although some ripening processes do occur before there are any visible signs of veraison.

There are a number of ways to define ripeness in grapevines, all of which are used in modern viticulture. The definition of maturity used depends on the wine style intended, for example:

- The production of some dry white wine styles requires grapes whose aromatic substances are at maximal concentration and whose acidity is relatively high. This might, in some cases, require an early harvest; and
- Red wine varieties grown in hot climates might require a relatively early harvest because sugar concentration can reach an optimum before other grape constituents are at desirable levels.



Figure 1. Grape bunch approaching veraison.
(Photo courtesy of AWRI image collection).

Table 1 Indicative juice composition for various types of wine. (Modified from Iland, P.G., Gago, P., Caillard, A. and Dry, P.R. (2009) *A Taste of the World of Wine*. Patrick Iland Wine Promotions, Adelaide).

Table wines	Sugar (Baumé)	Acidity (g/L)
Sparkling	9-11	8-12
Light bodied dry white	10-12	7-9
Full bodied dry white	12-14	6-8
Light bodied dry red	10-12	7-9
Full bodied dry red	12-14	5-9
Semi-sweet white	13-16	7-9
Sweet white	17-22	6-9
Port	14-16	4-6

Other topics in this Viti-Notes series include:

- Bud dormancy and budburst
- Spring shoot growth
- Flowering and pollination
- Berry development - up to veraison
- Berry development - Ripening
- *Defining berry ripeness*
- Site factors influencing berry ripening processes and rates of ripening
- Restricted Spring Growth syndrome

Juice or pulp maturity

The data in Table 1 is associated with an optimal sugar/acid ratio in the pulp for various wine styles. This index is not suitable for comparing different varieties as there is no biochemical relationship between sugar accumulation and acidity loss. There are some varieties that have both high sugar and acidity.

Skin maturity

Skin maturity has two definitions:

- The stage at which the phenolic compounds and aromatic substances reach a maximum desired ripeness and composition; and
- When the advanced dislocation of the cell wall from the skin occurs after which extraction of the desirable substances is easier.

Phenolic maturity

This is useful for certain red wine styles. Skins and seeds need separate analysis.

Aromatic maturity

This is not easy to define as it is often not related to sugar ripeness. Many aromas in red and white varieties increase in parallel with sugar ripeness and tend to plateau shortly before or when the berry is sugar-ripe.

Seed maturity

Full lignification of the seed (cracking upon crushing) is desirable for red wine styles but often lags behind other measures of ripeness.

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Further information

Useful references:

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Nicholas, P. 2003. Soil, irrigation and nutrition. Grape Production Series No. 2. Adelaide: Winetitles.

Gladstones, J. 1992. Viticulture and Environment. Adelaide: Winetitles.

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